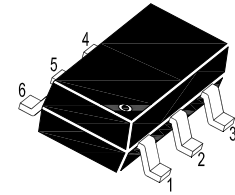
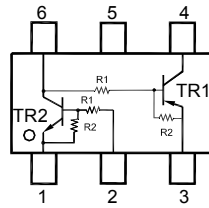


# MMDTX3241DW

## NPN/PNP Silicon Epitaxial Planar Digital Transistor

for switching and interface circuit and drivecircuit applications



1. Emitter 2. Base 3. Collector  
4. Emitter 5. NC 6. Collector2, Base1  
SOT-363 Plastic Package

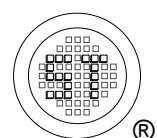
### Absolute Maximum Ratings ( $T_a = 25^\circ\text{C}$ )

| Parameter   | Symbol          | Value         | Unit                      |
|---|-----------------|---------------|---------------------------|
| Collector Base Voltage                                    | $V_{CBO}$       | 50            | V                         |
| Collector Emitter Voltage                                 | $V_{CEO}$       | 50            | V                         |
| Collector Current   | $I_C$           | 100           | mA                        |
| Total Power Dissipation <sup>1)</sup>                     | $P_{tot}$       | 357           | mW                        |
| Thermal Resistance from Junction to Ambient <sup>1)</sup> | $R_{\theta JA}$ | 350           | $^\circ\text{C}/\text{W}$ |
| Operating Junction Temperature Range                      | $T_j$           | - 55 to + 150 | $^\circ\text{C}$          |
| Storage Temperature Range                                 | $T_{stg}$       | - 55 to + 150 | $^\circ\text{C}$          |

1) FR-4 @ Minimum Pad

### Characteristics at $T_a = 25^\circ\text{C}$ (TR1: PNP)

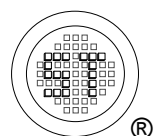
| Parameter  | Symbol         | Min. | Typ. | Max. | Unit             |
|--|----------------|------|------|------|------------------|
| DC Current Gain<br>at $-V_{CE} = 10\text{ V}$ , $-I_C = 5\text{ mA}$                                 | $h_{FE}$       | 20   | -    | -    | -                |
| Collector Base Cutoff Current<br>at $-V_{CB} = 50\text{ V}$  | $-I_{CBO}$     | -    | -    | 100  | nA               |
| Collector Emitter Cutoff Current<br>at $-V_{CE} = 50\text{ V}$                                       | $-I_{CEO}$     | -    | -    | 500  | nA               |
| Emitter Base Cutoff Current<br>at $-V_{EB} = 6\text{ V}$   | $-I_{EBO}$     | -    | -    | 1    | mA               |
| Collector Base Breakdown Voltage<br>at $-I_C = 10\ \mu\text{A}$                                      | $-V_{(BR)CBO}$ | 50   | -    | -    | V                |
| Collector Emitter Breakdown Voltage<br>at $-I_C = 2\text{ mA}$                                       | $-V_{(BR)CEO}$ | 50   | -    | -    | V                |
| Collector Emitter Saturation Voltage<br>at $-I_C = 10\text{ mA}$ , $-I_B = 0.3\text{ mA}$            | $-V_{CE(sat)}$ | -    | -    | 0.25 | V                |
| Output Voltage (On)<br>at $-V_{CC} = 5\text{ V}$ , $-V_B = 2.5\text{ V}$ , $R_L = 1\text{ K}\Omega$  | $-V_{OL}$      | -    | -    | 0.2  | V                |
| Output Voltage (Off)<br>at $-V_{CC} = 5\text{ V}$ , $-V_B = 0.5\text{ V}$ , $R_L = 1\text{ K}\Omega$ | $-V_{OH}$      | 4.9  | -    | -    | V                |
| Input Resistance   | $R_1$          | 3.3  | 4.7  | 6.1  | $\text{K}\Omega$ |
| Resistance Ratio   | $R_1/R_2$      | 0.38 | 0.47 | 0.56 | -                |



# MMDTX3241DW

## Characteristics at $T_a = 25^\circ\text{C}$ (TR2: NPN)

| Parameter  | Symbol        | Min. | Typ. | Max. | Unit             |
|--|---------------|------|------|------|------------------|
| DC Current Gain<br>at $V_{CE} = 10\text{ V}$ , $I_C = 5\text{ mA}$                                 | $h_{FE}$      | 80   | -    | -    | -                |
| Collector Base Cutoff Current<br>at $V_{CB} = 50\text{ V}$   | $I_{CBO}$     | -    | -    | 100  | nA               |
| Collector Emitter Cutoff Current<br>at $V_{CE} = 50\text{ V}$                                      | $I_{CEO}$     | -    | -    | 500  | nA               |
| Emitter Base Cutoff Current<br>at $V_{EB} = 6\text{ V}$  | $I_{EBO}$     | -    | -    | 0.1  | mA               |
| Collector Base Breakdown Voltage<br>at $I_C = 10\text{ }\mu\text{A}$                               | $V_{(BR)CBO}$ | 50   | -    | -    | V                |
| Collector Emitter Breakdown Voltage<br>at $I_C = 2\text{ mA}$                                      | $V_{(BR)CEO}$ | 50   | -    | -    | V                |
| Collector Emitter Saturation Voltage<br>at $I_C = 10\text{ mA}$ , $I_B = 0.3\text{ mA}$            | $V_{CE(sat)}$ | -    | -    | 0.25 | V                |
| Output Voltage (On)<br>at $V_{CC} = 5\text{ V}$ , $V_B = 2.5\text{ V}$ , $R_L = 1\text{ K}\Omega$  | $V_{OL}$      | -    | -    | 0.2  | V                |
| Output Voltage (Off)<br>at $V_{CC} = 5\text{ V}$ , $V_B = 0.5\text{ V}$ , $R_L = 1\text{ K}\Omega$ | $V_{OH}$      | 4.9  | -    | -    | V                |
| Input Resistance   | $R_1$         | 33   | 47   | 61   | $\text{K}\Omega$ |
| Resistance Ratio   | $R_1/R_2$     | 0.8  | 1    | 1.2  | -                |



TR1

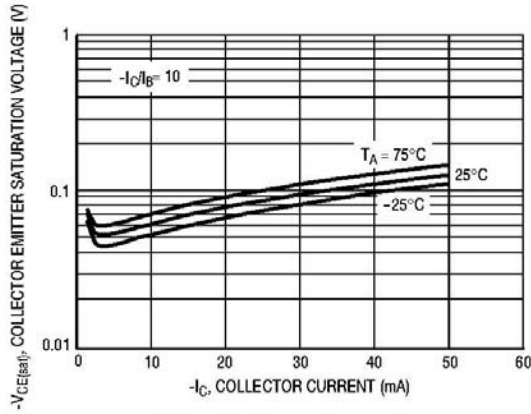


Figure 1.  $-V_{CE(sat)}$  versus  $-I_C$

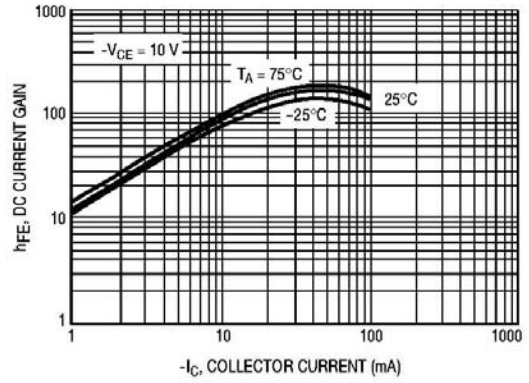


Figure 2. DC Current Gain

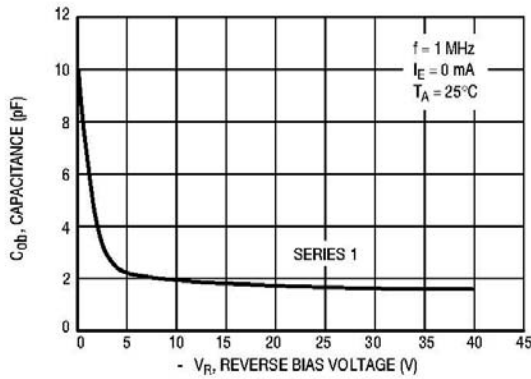


Figure 3. Output Capacitance

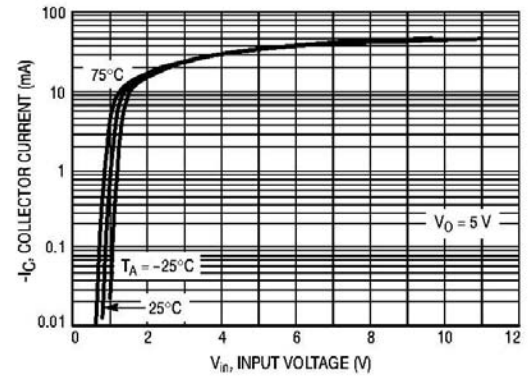
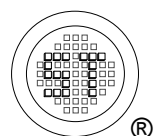


Figure 4. Output Current versus Input Voltage



TR2

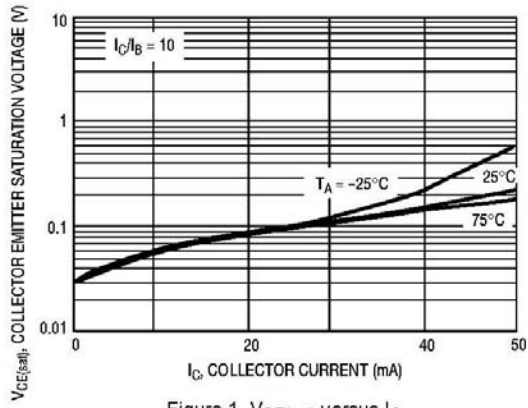


Figure 1.  $V_{CE(sat)}$  versus  $I_C$

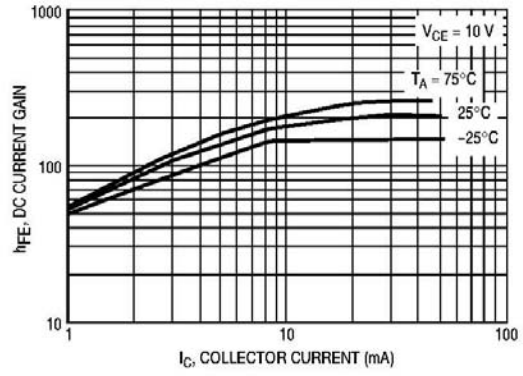


Figure 2. DC Current Gain

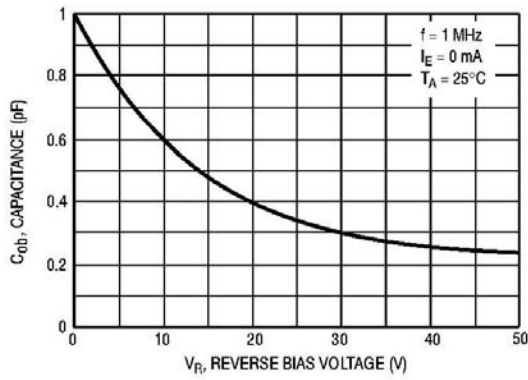


Figure 3. Output Capacitance

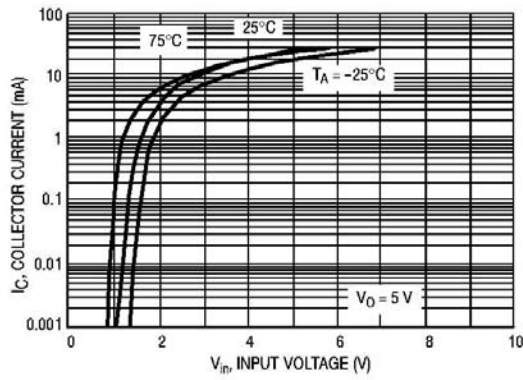
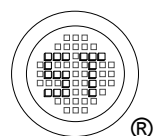


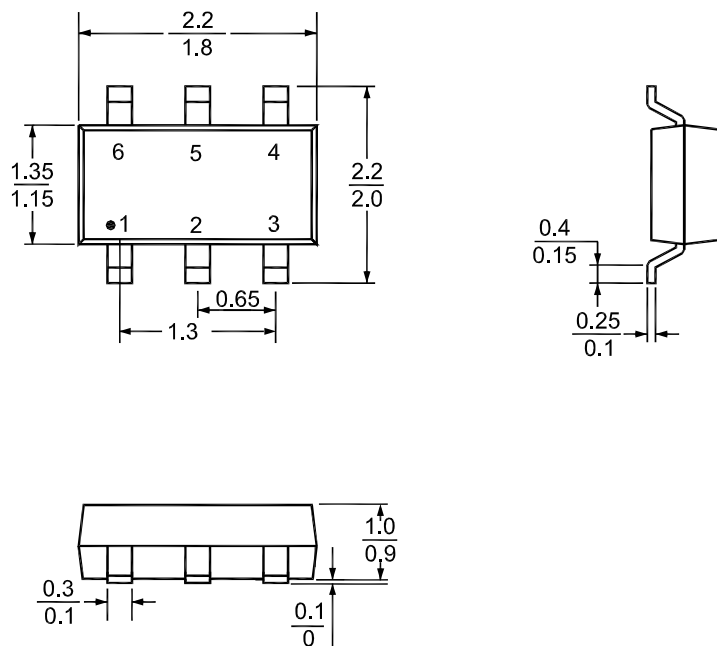
Figure 4. Output Current versus Input Voltage



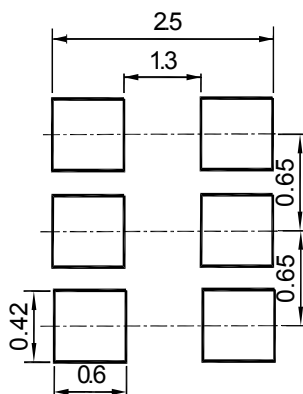
# MMDTX3241DW

Package Outline Dimensions (Units: mm)

SOT-363



## Recommended Soldering Footprint



## Packing information

| Package | Tape Width (mm) | Pitch   |               | Reel Size |      | Per Reel Packing Quantity |
|---------|-----------------|---------|---------------|-----------|------|---------------------------|
|         |                 | mm      | inch          | mm        | inch |                           |
| SOT-363 | 8               | 4 ± 0.1 | 0.157 ± 0.004 | 178       | 7    | 3,000                     |

